

Claims:

1. A fluid processing cell, comprising:
a rotatable substrate support member positioned in a processing volume, the substrate support member comprising:
a base member having a central fluid aperture formed therein; and
a fluid diffusion member sealably positioned to the base member and defining a fluid volume therebetween, the fluid diffusion member having a plurality of radially positioned bores formed therethrough; and
a fluid dispensing member positioned above the fluid diffusion member and being configured to dispense a processing fluid onto a substrate positioned on the substrate support member.
2. The fluid processing cell of claim 1, further comprising a fluid heater in fluid communication with the central fluid aperture.
3. The fluid processing cell of claim 2, wherein the fluid heater is configured to supply a heated fluid to the central fluid aperture at a constant temperature.
4. The fluid processing cell of claim 1, wherein the rotatable substrate support member further comprises a plurality of inwardly extending substrate support fingers positioned to support a substrate above the fluid diffusion member and in parallel relationship thereto.
5. The fluid processing cell of claim 1, wherein the rotatable substrate support member further comprises an annular substrate support ring positioned above the fluid diffusion member, the support ring having an inner diameter that is less than an outer diameter of the substrate and the fluid diffusion member.
6. The fluid processing cell of claim 1, wherein the plurality of radially positioned bores comprise circularly positioned rings of bores having an increasing ring

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diameter as the rings increase in distance from a central axis of the fluid diffusion member.

7. The fluid processing cell of claim 6, wherein a diameter of the bores increases as a distance from the central axis increases.

8. The fluid processing cell of claim 1, wherein the fluid dispensing member comprises a pivotally mounted fluid arm having a dispensing nozzle positioned on a distal end, the fluid arm being in fluid communication with at least one electroless solution source.

9. The fluid processing cell of claim 1, wherein the fluid dispensing member comprises an environmental shield positioned above the fluid diffusion member, the environmental shield having a substantially planar lower surface and a fluid dispensing aperture formed therein.

10. The fluid processing cell of claim 1, wherein the fluid diffusion member further comprises a plurality of heating elements positioned in communication with the diffusion member, the heating elements being positioned between the radially positioned bores.

11. The fluid processing cell of claim 10, wherein the plurality of heating elements are individually controlled.

12. An electroless deposition cell, comprising:

a cell body defining a processing volume;

a rotatable substrate support member positioned in the processing volume, the substrate support member comprising:

a fluid diffusion member having a plurality of fluid dispensing bores formed through an upper surface thereof, the plurality of bores being arranged in annular patterns about a central axis of the fluid diffusion member; and

at least one substrate support arm extending inwardly over the upper surface of the fluid diffusion member, the at least one substrate support arm being configured to support a substrate in parallel relationship to an upper surface of the fluid diffusion member in a face up orientation; and

a fluid dispensing nozzle positioned to dispense an electroless solution onto an upper surface of the substrate.

13. The deposition cell of claim 12, wherein the plurality of bores are positioned and sized to generate a uniform fluid temperature across the substrate.

14. The deposition cell of claim 12, further comprising a substrate support base member sealably attached to the fluid diffusion member to form a fluid volume between the support base and the fluid diffusion member, the fluid volume being in fluid communication with a source of heated fluid.

15. The deposition cell of claim 12, further comprising a source of heated fluid in fluid communication with the plurality of fluid dispensing bores.

16. The deposition cell of claim 15, wherein the source of heated fluid comprises fluid heater configured to receive fluid at a first temperature and dispense fluid at a second temperature that is higher than the first temperature, the second temperature being controlled to facilitate the electroless process.

17. The deposition cell of claim 12, further comprising a lift pin assembly positioned in the substrate support assembly, the lift pin assembly being configured to raise a substrate from the substrate support assembly.

18. The deposition cell of claim 12, further comprising a processing shield having a substantially planar lower surface selectively positioned in parallel relationship to the fluid diffusion member.

19. The deposition cell of claim 12, further comprising a plurality of heaters annularly positioned in the fluid diffusion member, the plurality of heaters being individually controlled.

20. A method for processing a substrate in a fluid processing cell, comprising:
positioning the substrate on a plurality of substrate support fingers configured to support the substrate above a fluid diffusion member and in parallel relationship thereto;
flowing a heated fluid through the diffusion member and against a backside of the substrate; and
dispensing a processing fluid onto a frontside of the substrate to conduct a fluid processing step.

21. The method of claim 20, further comprising controlling the temperature of the heated fluid.

22. The method of claim 20, wherein flowing the heated fluid comprises flowing the fluid through a plurality of bores formed through the diffusion member such that the fluid flow against the backside of the substrate is uniform moving radially outward from a center to a perimeter of the substrate.

23. The method of claim 22, wherein the uniform fluid flow is configured to generate a constant temperature across the frontside of the substrate.

24. The method of claim 20, wherein the processing fluid comprises an electroless solution and the heated fluid comprises deionized water.

25. The method of claim 20, further comprising rotating a substrate support member during the dispensing process.